

**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application No.: 10/732,850  
Filing Date: 12/10/03  
Applicant: Green et al.  
Group Art Unit: 1796  
Examiner: Patrick D. Niland  
Title: USE OF UREA CRYSTALS FOR NON-POLYMERIC  
COATINGS  
Attorney Docket: IN-5587  
HDP Docket No. 0906S-000337

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**APPLICANT'S APPEAL BRIEF UNDER 37 C.F.R. § 41.37**

Sir:

This is an appeal from the final rejection mailed March 20, 2009, for which Appellants filed a Notice of Appeal on July 20, 2009. This Brief is submitted along with the fee due under 37 C.F.R § 41.20(b)(2).

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### **Real Party in Interest**

The real party in interest is BASF Corporation, having a place of business at 26701 Telegraph Road, Southfield, Michigan 48034-2442, to which the inventor has assigned all rights in this invention. The assignment was recorded in the United States Patent and Trademark Office on December 10, 2003, at reel/frame: 014795/0489.

### **Related Appeals and Interferences**

An earlier appeal in this application, Appeal 2008-3412 before the Board of Patent Appeals and Interferences was decided July 18, 2008. A copy of the decision is attached at the end of this brief in the Related Proceedings Appendix.

### **Status of Claims**

Claims 1-19 are pending and stand finally rejected. This appeal is taken as to all of the rejected claims, claims 1-19.

### **Status of Amendments**

An amendment submitted on June 22, 2009 after the final office action of March 20, 2009 was entered by the Examiner.

### **Summary of Claimed Subject Matter**

Independent claims 1, 13, and 16 are pending.

Claim 1 is to a thermosetting coating composition comprising at least one monomeric material, at least one crosslinker, a crystalline reaction product, and optionally a polymeric or oligomeric material. Page 3, lines 6-11; page 2, lines 1-10; page 23, line 4 to page 25, line 8. The monomeric material has active hydrogen groups (such as carbamate groups, terminal urea groups, hydroxyl groups, carboxyl groups, mercapto groups, primary and secondary amine groups, and amides of primary amines). Page 5, lines 1-10. The crosslinker is reactive with active hydrogen groups (examples of such crosslinkers include compounds such as melamine formaldehyde crosslinkers, including monomeric or polymeric melamine resin. Page 14, line 22 to page 15, line 10. The crystalline reaction product is a reaction product of an amine and an isocyanate; for example, a reaction product of a monoamine such as the reaction product of benzyl amine with hexamethylene diisocyanate. Example 2, page 22, line 7 to page 23, line 3. Claims 2-12 and 17-19 are dependent on claim 1.

Independent claim 13 claims a method of coating a substrate with a coating composition by applying to the substrate a layer of thermosetting coating composition as described for claim 1 and curing the applied layer to produce a cured coating layer on the substrate. Page 4, lines 1-7; and page 17, line 15 to page 18, line 13. Claims 14 and 15 are dependent on claim 13.

Independent claim 16 is drawn to a thermosetting coating composition that is a clearcoat composition. Page 4, lines 15-16; page 18, lines 14-15; and page 24, lines 14-16. The composition includes a film-forming component and a crystalline reaction product of an amine and an isocyanate. Page 3, lines 6-11; page 2, lines 1-10; and page 23, line 4 to page 25, line 8.

The film-forming component consists of at least one monomeric material having a plurality of active hydrogen groups and at least one crosslinker reactive with the at least one monomeric material. Page 5, lines 1-10; and page 14, line 22 to page 15, line 10.

### **Grounds of Rejection to be Reviewed on Appeal**

1. Claims 1-3 and 7-16 stand rejected under 35 U.S.C. § 102(b) as allegedly anticipated by Boisseau et al. (U.S. Pat. App. Pub. No. 2002/0155278) with “Reactive Polymers Fundamentals and Application A Concise Guide to Industrial Polymers,” page 82 being cited as evidence;

2. Claims 1-16 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Boisseau et al. (U.S. Pat. App. Pub. No. 2002/0155278) in view of Green et al. (U.S. Pat. No. 5,872,195) and Ohrbom et al. (U.S. Pat. No. 5,756,213) with “Reactive Polymers Fundamentals and Applications A Concise Guide to Industrial Polymers”, page 82 cited as evidence; and

3. Claims 1-19 stand rejected under 35 U.S.C. § 103(a) as allegedly unpatentable over Ohrbom et al. (U.S. Pat. App. Pub. No. 2002/0119253; hereinafter Ohrbom ‘253) in view of Boisseau et al. (U.S. Pat. App. Pub. No. 2002/0155278).

## Argument

1. **Claims 1-3 and 7-16 are not anticipated by the Boisseau as the document fails to provide a thermosetting coating composition that includes a monomeric material having a plurality of active hydrogen groups, where the composition optionally comprises a polymeric or oligomeric material.**

The claims are not anticipated by Boisseau as the document does not disclose a thermosetting coating composition that includes a “monomeric material having a plurality of active hydrogen groups,” where the composition optionally comprises “a polymeric or oligomeric material.” Instead, the film-forming component of the Boisseau document is either a polymeric or oligomeric material. Proper interpretation of the claim language in view of the present specification, in comparison with the whole of the Boisseau disclosure, demonstrates that the Boisseau document lacks these claimed features.

"A rejection for anticipation under section 102 requires that each and every limitation of the claimed invention be disclosed in a single prior art reference." *In re Paulsen*, 30 F.3d 1475, 1478-79 (Fed. Cir. 1994); and see *Karsten Manufacturing Corp. v. Cleveland Golf Co.*, 242 F.3d 1376, 1383 (Fed. Cir. 2001) ("Invalidity on the ground of 'anticipation' requires lack of novelty of the invention as claimed . . . that is, all of the elements and limitations of the claim must be shown in a single prior reference, arranged as in the claim."). In the present case, independent claims 1, 13, and 16 each include “at least one monomeric material having a plurality of active hydrogen groups . . . and optionally a polymeric or oligomeric material.” The alleged anticipation fails because these claimed features are not provided by the Boisseau document.

The first step in anticipation analysis is the interpretation of Appellants’ claims. For brevity, particular features of just claim 1 are highlighted as follows:

A thermosetting coating composition comprising  
at least one **monomeric material** having a plurality of **active hydrogen groups**,  
at least one **crosslinker** reactive with the at least one monomeric material,  
a **crystalline reaction product** of an **amine** and an **isocyanate**, and  
optionally a **polymeric or oligomeric material**.

Marked in bold are first instances of claim elements and limitations, as arranged in the claim. These are separately recited features; it is improper to conflate any when none are recited as being one in the same. See *In re Wilder*, 429 F.2d 447, 166 USPQ 545, 548 (C.C.P.A. 1970) (every limitation positively recited in a claim must be given effect in order to determine what subject matter that claim defines).

During prosecution, the claim, including all of its elements and limitations as arranged, may only be given the broadest reasonable interpretation that is consistent with the specification. “[C]laims must be read in view of the specification, of which they are a part. . . . [T]he specification is always highly relevant to the claim construction analysis. Usually it is dispositive; it is the single best guide to the meaning of a disputed term.” *Phillips v. AWH Corp.*, 415 F.3d 1303, 1313, 75 USPQ2d 1321, 1326 (Fed. Cir. 2005) (*en banc*). The separate recitation of “monomeric,” “polymeric,” and “oligomeric materials” in claim 1 presumes these are each separate and different materials. This is borne out by the specification. These terms are used to distinctly refer to separate types of materials; *e.g.*, page 2, lines 1-21; page 5, line 1 to page 11, line 17; page 18, line 14 to page 19, line 13; *and see* U.S. Pat. Nos. 5,693,724, 5,693,723, 5,639,828, 5,512,639, 5,508,379, 5,451,656, 5,356,669, 5,336,566, and 5,532,061, which are



incorporated by reference as per page 1, lines 9-11; *and see* present Examples 4-6, which use a carbamate-functional monomer in conjunction with an acrylic polymer.

The present specification also uses the terms “monomeric,” “polymeric,” and “oligomeric” in their conventional senses, as typically understood by a person of ordinary skill in the coating arts. Terms and usages of the standard chemistry definitions of “monomeric,” “polymeric,” and “oligomeric materials” are reproduced below, as the meaning of a claim term may be defined by implication, that is, according to the usage of the term in the context in the specification. See *Phillips v. AWH Corp.* 415 F.3d 1303 (Fed. Cir. 2005).

**monomer molecule:** A molecule which can undergo polymerization thereby contributing constitutional units to the essential structure of a macromolecule.

**monomeric unit** (monomer unit, mer): The largest constitutional unit contributed by a single monomer molecule to the structure of a macromolecule or oligomer molecule. Note: The largest constitutional unit contributed by a single monomer molecule to the structure of a macromolecule or oligomer molecule may be described as either monomeric, or by monomer used adjectivally.

**oligomer molecule:** A molecule of intermediate relative molecular mass, the structure of which essentially comprises a small plurality of units derived, actually or conceptually, from molecules of lower relative molecular mass. Notes: A molecule is regarded as having an intermediate relative molecular mass if it has properties which do vary significantly with the removal of one or a few of the units. If a part or the whole of the molecule has an intermediate relative molecular mass and essentially comprises a small plurality of units derived, actually or conceptually, from molecules of lower relative molecular mass, it may be described as oligomeric, or by oligomer used adjectivally.

**polymer molecule:** See: macromolecule

**macromolecule (polymer molecule):** A molecule of high relative molecular mass, the structure of which essentially comprises the multiple repetition of units derived, actually or conceptually, from molecules of low relative molecular mass. Notes: In many cases, especially for synthetic polymers, a molecule can be regarded as having a high relative molecular mass if the addition or removal of one or a few of the units has a negligible effect on the molecular properties. This statement fails in the case of certain macromolecules for which the properties may be critically dependent on fine details of the molecular structure. If a part or the whole of the molecule has a high relative molecular mass and essentially comprises the multiple repetition of units derived, actually or conceptually, from molecules of low relative molecular mass, it may be described as either macromolecular or polymeric, or by polymer used adjectivally.

These definitions were originally provided on pages 8-9 of Appellants' Amendment filed September 18, 2008 (a copy is provided in Section 2.1 of the Evidence Appendix). Instances and uses of the terms "monomeric," "polymeric," and "oligomeric" at the locations in the present specification noted above comport with these standard definitions.

The present claims and specification are therefore referring to three distinct and different materials when reciting monomeric, polymeric, and oligomeric materials; *i.e.*, a monomeric material is not a polymeric material or an oligomeric material. A monomeric material is a molecule which can undergo polymerization thereby contributing constitutional units to the essential structure of a macromolecule, where a monomeric unit is the largest constitutional unit contributed by a single monomer molecule to the structure of a macromolecule or oligomer molecule.

The features "optionally a polymeric or oligomeric material" in independent claims 1, 13, and 16 further distinguish the "monomeric material having a plurality of active hydrogen groups" from other materials. During prosecution, the patent examiner and the applicant, in the give and take of rejection and response, work toward defining the metes and bounds of the invention to be patented. *See In re Zletz*, 893 F.2d 319, 321-22 (Fed. Cir. 1989) (the broadest reasonable construction of claims during examination serves to target ambiguities in claims at the time when the claims are readily amended).

Appellants submit that in the present case the separate recitation of monomeric, polymeric, and oligomeric materials within the claim serves to adequately distinguish the monomeric material from polymeric and oligomeric materials and that the usage in the specification and the general knowledge in the art establish that the monomeric material is not and cannot be a polymeric or oligomeric material. As such, Appellants submit that the concern

of the Board of Appeals in the Decision dated July 18, 2008 (a copy is attached in the Related Proceedings Appendix) and the concern of the Examiner with respect to the breadth of “monomeric material” is appropriately addressed by the present claim language and by the evidence now in the record. In particular, the “monomeric material” of claims 1, 13, and 16 is differentiated by the claim language from a “polymeric or oligomeric material” and is viewed by a skilled artisan as a wholly different material from a “polymeric or oligomeric material.”

The next step in ascertaining anticipation is comparing the interpretation of Appellants’ claims with the Boisseau document. Boisseau provides coating compositions and coating methods having a film-forming component (a) and may include a component (a)(i) having a plurality of active hydrogen-containing functional groups and a curing agent/crosslinking agent (a)(ii). Abstract; paragraphs [0022], [0048]-[0049], and [0099]. Notably, the only disclosed film-forming components (a) are polymeric or oligomeric components that generally comprise one or more compounds or components having a number average molecular weight of from 900 to 1,000,000, for example. Boisseau paragraph [0048]. Examples of active hydrogen group containing polymer resins (as film-forming component (ai)) include the polymers listed in Boisseau paragraph [0051]. There is no disclosure of monomers as the film-forming component.

In particular, Boisseau discloses how to prepare polymers for use as the film-forming component (a). See Boisseau paragraph [0054]; see also paragraphs [0063] to [0098] for preferred carbamate functional polymers, polyester polymers, and polyurethane polymers. The express reference to monomers in Boisseau is only in terms of using the monomers to prepare one or more polymers or oligomers as the film-forming component (ai). See Boisseau paragraphs [0052], [0054], and [0055]. It is the prepared polymers and oligomers, not the consumed monomer, that Boisseau puts into his coating composition. The use and context of the

terms “polymer,” “oligomer,” and “monomer” in Boisseau are in accord with the general understanding of these terms in the art and a person of ordinary skill in the coating arts readily recognizes that Boisseau is referring to separate and different materials. The description of these materials and use of the associated terminology in Boisseau also comport with the definitions in the extrinsic sources reproduced above and provided in the amendment filed September 18, 2009, which are attached to this brief in sections 2.1-2.4 of the Evidence Appendix.

There is no confusion or overlap between a monomer and an oligomer in Boisseau and the document is referring to different materials and acknowledges them as such. There is no instance or implication in Boisseau that an oligomer refers to anything other than a material formed from a few monomers; *e.g.*, a few monomers react to form oligomers, but as such an oligomer can never be a monomer.

The present claims are therefore novel over Boisseau as the disclosed coating having a (polymeric or oligomeric) film-forming component (a) and a rheology control agent (b) does not provide all the features of independent claims 1, 13, and 16. Namely, Boisseau lacks “at least one monomeric material having a plurality of active hydrogen groups . . . and optionally a polymeric or oligomeric material.”

The Examiner however continues and somehow surmises that Boisseau discloses a “macromonomer,” which is alleged to be a monomer, and uses this definition to connect the Boisseau material to the monomeric material in the present claims. A “macromonomer” is not a monomeric material as in Appellants’ claims, and even if it were, Boisseau does not disclose macromonomers. The Office Action dated September 29, 2009, on page 5, refers to “Reactive Polymers Fundamentals and Applications A Concise Guide to Industrial Polymers,” page 82, for the definition of “macromonomer” as “a polymer that contains reactive groups.” At the outset,

Appellants submit that the present claims, the present specification, and the Boisseau document do not even contain the term “macromonomer,” and hence the definition is not relevant to the issue at hand. Appellants further submit that the document pages provided by the Examiner are illegible as included with the Office Action dated September 29, 2008, and the electronic copy posted on Private PAIR is likewise illegible. (Appellants requested a legible copy in the Amendment filed June 22, 2009 on page 17, but were not provided one.) Hence, no evidence presently in the record supports the Examiner’s claims.

The Examiner alleges that the Boisseau disclosure of polymeric or oligomeric film-forming component (a) accounts for the presently claimed monomeric material. As best can be understood, the Examiner’s reasoning is as follows. First, the Examiner alleges the Boisseau film-forming component (a) is a “macromonomer,” which by the very definition supplied is “a *polymer* that contains reactive groups” (emphasis added). Second, the Examiner alleges that a “macromonomer” is a “monomer.” Thus, according to the Examiner’s reasoning, a polymer is a monomer.

This series of unreasonable presumptions is a non sequitur. The conclusion that a “macromonomer,” which according to the very definition supplied is “a polymer,” is somehow a “monomer” is unexplainable, it is not reasonable, it does not comport with any conventional interpretation in the art, and such a view is not commensurate with the usage of “monomer,” “oligomer,” and “polymer” as found in the present specification, as found in the Boisseau document, and as found in the general knowledge in the art.

As evidence that such reasoning is contrary to the plain meaning and generally accepted knowledge in the chemical and coating arts, Appellants again proffer the standard chemistry definitions of “monomeric,” “polymeric,” and “oligomeric materials” as supplied with the

Amendment filed September 18, 2008 and provided in sections 2.1-2.4 of the Evidence Appendix of this brief. A polymer is not generally considered a monomer, and the present use of “monomer” is never as a “polymer,” either in the present specification or in the Boisseau document.

Even if, for the sake of argument, someone unfamiliar with the chemical arts makes the conjecture that appearance of the terms “polymer” and “monomer” in a claim would somehow allow for an instance where the “polymer” is a “monomer,” based on the Examiner’s cited document, such a view is at odds with the evidence at hand. If extrinsic reference sources, such as dictionaries, evidence more than one definition for the term, the intrinsic record must be consulted to identify which of the different possible definitions is most consistent with applicant’s use of the terms. *Brookhill-Wilk 1, LLC v. Intuitive Surgical, Inc.*, 334 F. 3d at 1300, 67 USPQ2d at 1137 (2003); see also *Renishaw PLC v. Marposs Societa' per Azioni*, 158 F.3d 1243, 1250, 48 USPQ2d 1117, 1122 (Fed. Cir. 1998) (“Where there are several common meanings for a claim term, *the patent disclosure* serves to point away from the improper meanings and toward the proper meanings.”) (emphasis added). In this case, the most relevant disclosure is Appellants’ specification, which distinguishes a polymer from a monomer. The second most relevant disclosure is the Boisseau document, which also distinguishes a polymer from a monomer. This leaves the Examiner’s cited definition for a term not used in either the claims or specification, and which is inconsistent with the sources that matter.

There is no confusion or contradiction between the terms “polymer,” “oligomer,” and “monomer” in the present claims, the present specification, and the Boisseau document. The only contradiction is the Examiner’s contortion of “macromonomer,” a term not found in the either the present specification or the Boisseau document, to somehow make the polymeric or

oligomeric film-formers of Boisseau be something they are not. Finally, the Examiner's interpretation of a "polymer" as a "monomer" contravenes the rule of *In re Wilder* against conflating distinctly recited claim limitations.

During patent examination, claims may only be interpreted as broadly as their terms reasonably allow. The operative word is *reasonably*, and it is unreasonable to interpret the claim terms in contravention to their accepted meanings in the art and their use in the present specification as well as their use in the art being applied. The Examiner's inference that the oligomers or polymers of Boisseau are "macromonomers" and somehow qualify as "monomers" is without merit. Notably, the term "macromonomer" is absent in both the present specification and the Boisseau document, and making a "polymer" be a "monomer" is at odds with examples and usage the terms "polymer," "oligomer," and "monomer" in the present specification and Boisseau. For example, Boisseau explicitly illustrates how oligomers and polymers are formed from monomers. The resulting oligomers and polymers are never then referred to as monomers. It is improper to manufacture alternative meanings for claim terms where there is no ambiguity in the present specification, and where, as in this case, there is no ambiguity in interpreting the terms as used in Boisseau.

An example of an unreasonable interpretation of claims in the chemical arts is illustrated by *In re Buszard*, 504 F.3d 1364, 84 USPQ2d 1749 (Fed. Cir. 2007), where the Federal Circuit found the claim interpretation unreasonable and the claims not anticipated. The patent applicant claimed a composition that produces a flexible polyurethane foam. *In re Buszard*, 84 USPQ2d at 1749. The Board and examiner held the claim anticipated by any reaction mixture which produces, at least ultimately, a flexible polyurethane foam. *In re Buszard* at 1750. The cited reference disclosed a rigid polyurethane foam which when mechanically crushed loses its rigidity

because it is in small particles. *In re Buszard* at 1750. However, the applicant argued that the rigid foam product is chemically different from a flexible polyurethane foam and that this difference is readily understood by a person of ordinary skill. *In re Buszard* at 1750. The court held that “[n]o matter how broadly ‘flexible foam reaction mixture’ is construed, it is not a rigid foam reaction mixture” and “it is not a reasonable claim interpretation to equate ‘flexible’ with ‘rigid,’ or to equate a crushed rigid polyurethane foam with a flexible polyurethane foam. *In re Buszard* at 1751.

By analogy, in the present case, it is unreasonable to equate “monomer” with “polymer.” Regardless of the existence of a “macromonomer” (defined as a *polymer* that contains reactive groups), such a material is not present in the Boisseau reference and to further simply default the “macromonomer” to equate to a “monomer,” due to the root of the word is to ignore its meaning. This is especially true in view of the present claims that simultaneously include and separately recite “monomeric material” and “polymeric or oligomeric material.” One can not subsume the “monomeric material” to be a “polymeric material,” just as flexible foam is not rigid foam.

The Examiner’s claim interpretation does not constitute the broadest *reasonable* interpretation for these claims in view of this specification.

The present rejection is further flawed by relying on a single sentence of Appellants’ specification taken in isolation. Instead of interpreting the claim feature in view of the whole of the specification, the rejection discounts the separate recitation of both “monomeric material” and “polymeric or oligomeric material” within the claims themselves and their differentiated use throughout the specification, and instead interprets “monomeric material” using the single sentence at page 10, lines 4-5, taking this sentence entirely out of context. The whole of the paragraph is reproduced below, with the subject sentence in bold:



In a preferred embodiment, the monomeric material may be a material as described in Ohrbom et al., U.S. Pat. No. 6,541,594, filed Dec. 19, 2000 and issued Apr. 1, 2003, incorporated herein by reference. The clearcoat coating composition particularly includes a carbamate-functional material having at least two carbamate groups, preferably two to four carbamate groups, and more preferably two carbamate groups and a hydrocarbon moiety with about 24 to about 72 carbon atoms, preferably about 36 to about 72 carbon atoms, and more preferably about 36 to about 54 carbon atoms, and particularly preferably about 36 carbon atoms. The hydrocarbon moiety may include cycloaliphatic or aromatic structures. Such materials may be prepared, for example, by addition reaction of unsaturated monofunctional fatty acids having 12 to 18 carbon atoms according to known methods, followed by conversion of the acid group to a carbamate group. The unsaturated fatty acids may be dimerized, trimerized, or tetramerized. **Higher oligomer products are also possible, but not preferred.** The acid groups may be converted to carbamate or urea groups by a number of known means. For example, the acid may be reduced to an alcohol group and then the alcohol group reacted with a hydroxy carbamate or urea compound such as hydroxypropyl carbamate or hydroxyethylene ethyl urea to introduce the carbamate functionality. Another method of synthesis involves reaction of an hydroxyl group with cyanic acid (which may be formed by the thermal decomposition of urea). Hydroxyl groups can also be converted to carbamate groups by reaction with low molecular weight monoisocyanates (e.g., methyl isocyanate, ethyl isocyanate, propyl isocyanate, and butyl isocyanate). An hydroxyl group can also be reacted with phosgene and then ammonia or a primary amine to form a carbamate group.

Most notably, “oligomer products” in the subject sentence is *not* referring to oligomers of the claimed monomeric material, it is referring to the preceding sentence describing that “[t]he unsaturated fatty acids may be dimerized, trimerized, or tetramerized.” For example, individual fatty acids do not have a plurality of active hydrogen groups, as does the presently claimed monomeric material; *i.e.*, they cannot be the claimed monomeric material having a plurality of active hydrogen groups. Subsequent addition reaction products of the fatty acids therefore cannot constitute “oligomeric” variants of the claimed monomeric material or vice versa.

The claimed monomeric material does not embody (the separately recited and illustrated) oligomeric material. Formation of the monomeric material from addition reaction of multiple fatty acids produces a monomeric material having a plurality of active hydrogen groups, where

the acid groups can be converted to carbamate groups, for example. Present specification page 10, lines 5-6, and see structures on page 11. These structures are not a series of a few repeating units and the individual “units” of fatty acids do not each have a plurality of active hydrogen groups, as required by the claimed monomeric material. Instead, only the structures from the addition reaction of multiple fatty acids provide two to four radiating acid groups that are converted to carbamate groups, forming a monomeric material having a plurality of active hydrogen groups. In other words, there are no constitutional monomer units identifiable in such structures, as compared to oligomers illustrated in Boisseau, and the fatty acids each do not have a plurality of active hydrogen groups; *i.e.*, individually they cannot be the claimed monomeric material.

Thus, the quoted passage – “higher oligomer products are also possible, but not preferred” – is solely referring to the “oligomer products” of the unsaturated fatty acids reacted via addition reaction to cycloaliphatic or aromatic structures to form the monomeric material; *i.e.*, the dimers, trimers, or tetramers in the preceding sentence. Exemplary structures of such materials are shown in paragraph [0021], page 11; and see Ohrbom et al., U.S. patent 6,541,594, as incorporated by reference, at col. 5, lines 34-45 and col. 6, line 44 to col. 8, line 25. These are also not oligomers as described and provided by Boisseau, just as the decahydronaphthalene portion of the structures shown in present claims 17-19 would not be considered to present a “hexane dimer.” Consequently, “oligomer products” as found at page 10, lines 4-5 is not used in reference to oligomers of the claimed monomeric material, but is referring to additions of the unsaturated fatty acids to the hydrocarbon moiety to form an exemplary monomeric material. As shown in claims 17-19, the acid groups of the fatty acid addition product can be converted to form a plurality of carbamate groups. Page 10, lines 5-15.

The manner in which the Examiner is interpreting the quoted passage is in isolation and is not in agreement with the immediately preceding sentence, is not in agreement with the remainder of the paragraph, and is not in agreement with the specification properly viewed as a whole. Individual fatty acids cannot constitute the presently claimed monomeric material having a plurality of active hydrogen groups, and addition reaction thereof does not result in an “oligomer” of the presently claimed monomeric material.

Finally, pages 4 and 5 of the Office Action dated March 20, 2009, states that the examples in the present specification (pages 20-25) include polymeric substances among the instantly claimed “monomeric materials” and therefore the Examiner incorrectly concludes that the claimed “monomeric material” includes oligomeric or polymeric materials.

Such a conclusion is contrary to established precepts of claim interpretation. First, Appellants’ claims are presented as open-ended with the transition phrase “comprising,” which permits additional components beyond the claimed “monomeric material.” Second, Appellants’ claims explicitly include “optionally a polymeric or oligomeric material” in addition to the explicitly claimed “monomeric material.” Thus, there is no reason to interpret the “monomeric material” as also encompassing polymeric or oligomeric material. Such an interpretation does not logically follow from the plain language of the claim in the first place, nor is it consistent with the specification.

Consequently, it is improper for the Examiner to require the claimed “monomeric material” to embody the polymeric or oligomeric materials provided in the specification.

In sum, the terms “polymeric,” “oligomeric,” and “monomeric” are used separately and distinctly and refer to different materials in the claims. Never is an oligomer described as a “macromonomer;” and such an inference is without support and is contrary to usage in both the

specification and the cited Boisseau document. The Boisseau composition cannot anticipate the present invention as it fails to include “at least one monomeric material having a plurality of active hydrogen groups . . . and optionally a polymeric or oligomeric material.” Since independent claims 1, 13, and 16 are not anticipated, all dependent claims stemming therefrom are not anticipated.

Accordingly, the 35 U.S.C. § 102 rejection based on Boisseau with “Reactive Polymers Fundamentals and Application A Concise Guide to Industrial Polymers,” page 82 being cited as evidence should be REVERSED.

- 2. Claims 1-16 are not obvious over Boisseau, Green, and Ohrbom as the combined documents fail to provide for the claimed monomeric material, and there is no apparent reason to replace the film-forming component (*i.e.*, the polymeric or oligomeric resin of Boisseau) with the presently claimed monomeric material.**

As detailed in traverse of the 102 rejection above, the Boisseau document fails to teach a coating composition having at least one monomeric material that has a plurality of active hydrogen groups. Addition of the Green and Ohrbom documents fails to cure this deficiency. Since the combination must teach all of the claim limitations or provide an apparent reason to include the missing subject matter, the present claims are not obvious. See *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 82 USPQ2d 1385, 1396 (2007) (obviousness includes determining whether there was an apparent reason to combine the known elements in the fashion claimed by the patent at issue); *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991) (combined references must teach or suggest all the claim limitations to establish a *prima facie* case of obviousness). In particular, there is no apparent reason or basis in the combination of documents to replace the film-forming component (*i.e.*, the polymeric or oligomeric resin of

Boisseau) with a monomeric material to make a coating composition with at least one monomeric material having a plurality of active hydrogen groups. These documents do not appreciate use of the monomeric material as found in the present claims and, in fact, the Boisseau polymers or oligomers would actually lead a skilled artisan away from using a monomeric material.

With respect to Boisseau, the shortcomings of the document are illustrated in the preceding section. Likewise, the rejection's basis for interpreting the oligomer of Boisseau as a "macromonomer" is irrelevant as this term appears nowhere in the art of record and the associated reasoning contravenes the separate recitation and use of "monomer" and "oligomer," as illustrated by the present application and the cited documents. Finally, as illustrated above, reliance on page 10, lines 4-5 of the present specification in isolation as allegedly teaching that the claimed monomeric material is the same as an oligomer as disclosed in Boisseau is flawed.

With respect to Ohrbom, the document describes a compound (A) that has a carbamate or urea functionality where a compound (A)(1) having a carbamate or urea group and a hydroxyl group is reacted with a compound (A)(2) which may be a dialkyl carbonate, cyclic carbonate, or CO<sub>2</sub>. Reaction of (A)(1) with (A)(2) will result in a compound having the residues of two (or more) (A)(1) compounds linked together by a carbonate group formed from the residue of compound (A)(2). With inclusion of a polyol, a polycarbonate compound can be formed. Ohrbom col. 2, lines 19-34; see also col. 7, lines 52-67. Thus, at least two (A)(1) compounds are joined by an (A)(2) compound (i.e., at least two (A)(1) subunits/monomers are joined) and/or a polycarbonate polymer is formed. As a result, Ohrbom does not disclose a coating composition having a monomeric material as described by the present invention.

With respect to Green, the document discloses a curable coating composition having a polymer resin, curing agent, and a compound (c) having at least one carbamate group that is the reaction product of a hydroxyl group from a ring-opening reaction between an epoxy group and an organic acid group, and cyanic acid or a carbamate group. Green claim 1; abstract; col. 2, lines 1-11; and col. 5, lines 28-36. Thus, Green describes a polymeric coating composition where a polymer resin with active hydrogen-containing functional groups reacts with a curing agent. The Green polymeric coating composition further contains a carbamate compound (c) that contains at least one carbamate group, but the primary film-forming component of Green is the polymer resin, examples of which are listed in col. 2, lines 14-27.

The background of Green indicates that curable coating compositions utilizing carbamate-functional resins provide significant etch advantages. However, there is no suggestion or motivation that a skilled artisan would gather from the combination of Green, Boisseau, and Ohrbom that would lead to a coating composition having a monomeric material having a plurality of active hydrogen groups. In each document (Green, Boisseau, and Ohrbom), the respective coating compositions contain a polymeric resin (Green), a film-forming component that is a polymer or oligomer (Boisseau), or at least two of the same compound linked that can further include polycarbonates (Ohrbom), where each in turn reacts with a crosslinker.

In addition, compound (c) of the Green document contains “at least one carbamate” group while the present invention describes a monomeric material having a “plurality of active hydrogen groups,” which can be carbamate groups. A “plurality of active hydrogen groups” in the present invention requires at least two such groups. See, for example, page 11, lines 1-15 of the present specification illustrating various embodiments of the monomeric material having two

carbamate groups; and see page 6, line 18 describing embodiments of the monomeric material comprising “at least two functional groups.” The difference between having one carbamate group and two carbamate groups is important in the curing of a coating composition. For example, all three of the cited documents contain other polymeric resins that react with a crosslinker to form a polymerized cured coating. In contrast, the present invention does not require a polymeric resin that reacts with a crosslinker.

The carbamate compound (c) from Green is further differentiated from the monomeric material of the present invention in that since compound (c) can have just one carbamate group, it would then react with a crosslinker at only the single carbamate moiety. As such, the cured coating composition in Green would be very different from the cured coating composition of the present invention where the coating composition including the monomeric material with a plurality (*i.e.*, at least 2) of active hydrogen groups reacts with a crosslinker.

Thus, the present invention identifies and utilizes a specific species of carbamate containing compounds (*e.g.*, monomeric materials having at least two carbamates). A monomeric material having a single carbamate group would not function in a similar fashion and is not included in the presently claimed invention. Therefore, the monomeric material having a plurality of active hydrogen groups would not have been obvious in the combination of the aforementioned documents, since each of the documents contains a separate polymeric resin which can react with a crosslinker to provide a polymerized and cured coating. Addition of a single carbamate containing compound (c) from the Green document can react with a crosslinker, but cannot participate in the same type of curing reaction as can the monomeric material having a plurality of active hydrogen groups of the present invention.

No apparent reason or basis is identified in the rejection as to why a skilled artisan would use a monomeric material with a plurality (at least two) of reactive hydrogen groups in a coating composition based on the cited documents. The present claims are consequently not obvious.

Accordingly, the 35 U.S.C. § 103(a) rejection based on Boisseau, Green, and Ohrbom with “Reactive Polymers Fundamentals and Applications A Concise Guide to Industrial Polymers”, page 82 cited as evidence should be REVERSED.

3. **Claims 1-19 are not obvious in view of Ohrbom ‘253 and Boisseau as the combination fails to provide the claimed crystalline reaction product of an amine and an isocyanate and Ohrbom ‘253 expressly teaches away from using a crystalline solid.**

The present claims are patentable over the combination of Ohrbom ‘253 and Boisseau as there is no apparent reason for a person of ordinary skill to select and combine features of these documents in a manner that would reproduce Appellants’ claims. In particular, Appellants’ claims expressly require “a crystalline reaction product of an amine and an isocyanate,” whereas the coating of Ohrbom ‘253 expressly does *not* contain a crystalline solid, effectively teaching away from Appellants’ composition. Any attempted combination of Ohrbom ‘253 with Boisseau by a person of ordinary skill in the art would therefore avoid crystalline materials, as mandated by Ohrbom ‘253. And there is no basis provided in these documents or the general knowledge in the art for a skilled artisan to contravene the teachings of Ohrbom to include a crystalline material. Moreover, the fact that features of Appellants’ claims are simply known in the art cannot form a case of obviousness, there must be a reason to combine the features as per the present claims, there must be a reason to contravene the teachings of Ohrbom ‘253, and the function of the alleged combination must also be predictable to one of skill in the art. The



present rejection consequently fails to provide the explicit and requisite analysis to establish a case of obviousness.

Obviousness requires an apparent reason for a skilled artisan to combine features of prior art references. *KSR Int'l Co. v. Teleflex Inc.*, 550 U.S. 398, 418, 82 USPQ2d 1385, 1396 (2007). The basis for the combination may be found in the references themselves or in the general knowledge in the art. However, the apparent reason to combine or modify the references should be made explicit in order to facilitate review. *Id.* at 418; *In re Kahn*, 441 F3d 977, 988, 78 USPQ2d 1329, 1336 (Fed. Cir. 2006) (“[R]ejections on obviousness grounds cannot be sustained by mere conclusory statements; instead, there must be some articulated reasoning to support the legal conclusion of obviousness.”).

In the present case, the alleged reasoning to combine Ohrbom ‘253 and Boisseau appears in the sentence on page 10 of the Office Action dated March 20, 2009, spanning line 6 down to line 16. As best can be ascertained, it appears that the rejection alleges the crystalline reaction product of an amine and an isocyanate (as per Boisseau) would be combined with the coatings discussed in Ohrbom ‘253, which can include the monomeric materials having a plurality of active hydrogen groups (as per present claims 17-19). It is alleged that the crystalline reaction product would be expected to provide antisag properties and rheology control, as described by Boisseau.

The primary reference of Ohrbom ‘253 discloses coating compositions that contain reactive component (a), which is substantially free of heteroatoms and is notably *not* a crystalline solid at room temperature, in conjunction with a particular crosslinking agent (b). Ohrbom ‘253 abstract; and paragraphs [0013]-[0014], and [0017]. “‘Crystalline’ refers to a solid characterized by a regular, ordered arrangement of particles. Rather, reactive component (a) will be an

amorphous solid, a wax or a liquid at room temperature. 'Amorphous' refers to a noncrystalline solid with no well-defined ordered structure." Ohrbom '253 paragraph [0021]. Examples of reactive components (a) include the structures shown in Ohrbom '253 paragraph [0042]. Crosslinking agent (b) must have a plurality of functional groups reactive with functional groups of reactive component (a). Ohrbom '253 paragraph [0017]. The coatings provide good environmental etch resistance and have an increased nonvolatile or decreased volatile organic content at a sprayable viscosity. Ohrbom '253 paragraph [0012]. Thus, the Ohrbom coating composition expressly does *not* include crystalline material, unlike the present claims that require a crystalline reaction product of an amine and an isocyanate.

Details of the Boisseau document are illustrated in the preceding sections. Briefly, Boisseau provides a coating for both vertical and horizontal surfaces. The coating composition includes a film-forming component (a) and a rheology control agent (b) having microparticles (i) and a compound (ii) comprising the reaction product of an amine and an isocyanate. Boisseau paragraph [0019]. The film-forming component (a) is polymeric or oligomeric, having a number average molecular weight of from 900 to 1,000,000, for example. Boisseau paragraph [0048]. The balance of vertical sag control and horizontal flow is believed to result from the combination of the microparticles (i) and the compound (ii) comprising the reaction product of amine and isocyanate in the rheology control agent (b). Boisseau paragraph [0023]. The rheology control agent (b) provides improvements unattainable when either the microparticles (i) or the compound (ii) are used alone. Boisseau paragraph [0023].

Regardless of the reason a skilled artisan might combine Ohrbom '253 and Boisseau (Appellants do not admit that such a reason even exists), any collective coating composition must account for the whole teachings of the primary reference of Ohrbom '253 and the express

requirement that a crystalline material *not* be used. Aspects of the properties and/or benefits provided by the Ohrbom '253 disclosure would likely be lost if a crystalline material is employed. As such, a person of ordinary skill would be led away from recreating Appellants' claims based on the Ohrbom '253 disclosure and would not combine features of Ohrbom '253 and Boisseau in a manner that would result in the present claims.

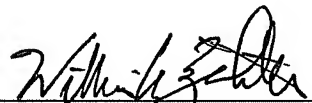
In addition, as recognized in the MPEP, "[t]he mere fact that references *can* be combined or modified does not render the resultant combination obvious unless the results would have been predictable to one of ordinary skill in the art." MPEP 2143.01.III (emphasis in original). There is no basis for such predictability found either in the cited references or provided based on the general knowledge in the art. And a statement that modifications of the prior art to meet the claimed invention would have been "well within the ordinary skill of the art at the time the claimed invention was made," merely because elements of the claimed invention were individually known in the art, is not sufficient to establish a *prima facie* case of obviousness without some objective reason to combine the teachings of the references. *Ex parte Levengood*, 28 USPQ2d 1300 (B.P.A.I. 1993). Here, there is no apparent reason found in the cited references or based on the general knowledge in the art that would lead a skilled artisan to predict that using a crystalline material (from Boisseau) in a composition according Ohrbom '253 would be successful, especially since crystalline materials are prohibited by Ohrbom '253. The combined documents therefore cannot establish a case of obviousness.

Accordingly, the 35 U.S.C. § 103(a) rejection based on Ohrbom '253 and Boisseau should be REVERSED.

For these and the other reasons discussed above, Appellants respectfully request that all rejections of Claims 1-19 be REVERSED.

Respectfully submitted,

Dated: Sept. 17, 2009

By:   
William A. Ziehler, Reg. No. 61,415

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## Claims Appendix

1. A thermosetting coating composition comprising  
at least one monomeric material having a plurality of active hydrogen groups,  
at least one crosslinker reactive with the at least one monomeric material,  
a crystalline reaction product of an amine and an isocyanate, and  
optionally a polymeric or oligomeric material.
2. A thermosetting coating composition according to claim 1, wherein the active hydrogen groups are selected from carbamate groups, terminal urea groups, hydroxyl groups, carboxylic acid groups, and combinations thereof.
3. A thermosetting coating composition according to claim 1, wherein the crosslinker is reactive with the crystalline reaction product.
4. A thermosetting coating composition according to claim 1, wherein the at least one monomeric material having a plurality of active hydrogen groups comprises a carbamate-functional or terminal urea-functional monomeric material comprising at least two functional groups, at least one of which is a carbamate or terminal urea group that is the reaction product of (1) an hydroxyl group of a first compound that is the result of a ring-opening reaction between a compound with an epoxy group and a compound with an organic acid group and (2) cyanic acid or a carbamate or urea group-containing compound.

5. A thermosetting coating composition according to claim 1, wherein the at least one monomeric material having a plurality of active hydrogen groups comprises a carbamate-functional or terminal urea-functional material that is the reaction product of (1) a compound comprising a carbamate or terminal urea group and an active hydrogen group that is reactive with (2), and (2) a lactone or an hydroxy carboxylic acid.

6. A thermosetting coating composition according to claim 1, wherein the at least one monomeric material having a plurality of active hydrogen groups comprises a carbamate-functional or terminal urea-functional material that is the reaction product of a first material (A) that is prepared by reacting (1) a compound comprising a primary carbamate or terminal urea group and an hydroxyl group and (2) a lactone or a hydroxy carboxylic acid reacted with a second material (B) that is reactive with hydroxyl groups on a plurality of molecules of compound (1), but that is not reactive with the carbamate or urea groups on compound (1).

7. A thermosetting coating composition according to claim 1, wherein the at least one monomeric material having a plurality of active hydrogen groups comprises a carbamate-functional or terminal urea-functional material that is the reaction product of (1) a first material that is the reaction product of a mixture including at least a polyisocyanate and an active hydrogen-containing chain extension agent with (2) a compound comprising a group that is reactive with said first material and a carbamate or terminal urea group or group that can be converted to a carbamate or terminal urea group.

8. A thermosetting coating composition according to claim 1, wherein the at least one monomeric material having a plurality of active hydrogen groups comprises a carbamate-functional material having at least two carbamate groups and a hydrocarbon moiety with about 24 to about 72 carbon atoms,

9. A thermosetting coating composition according to claim 1, wherein the amine is a primary monoamine.

10. A thermosetting coating composition according to claim 1, wherein the amine is selected from the group consisting of benzylamine, ethylamine, propylamine, butylamine, pentylamine, hexylamine, methylbutylamine, ethylpropylamine, ethylbutylamine, and combinations thereof.

11. A thermosetting coating composition according to claim 1, wherein the isocyanate comprises 1,6-hexamethylene diisocyanate.

12. A thermosetting coating composition according to claim 1, further comprising fumed silica.

13. A method of coating a substrate with a coating composition, having steps of:  
applying to the substrate a layer of thermosetting coating composition comprising at least one monomeric material having a plurality of active hydrogen groups, at least one crosslinker reactive with the at least one monomeric material, a crystalline reaction product of a primary monoamine and an isocyanate, and optionally a polymeric or oligomeric material; and  
curing the applied layer to produce a cured coating layer on the substrate.

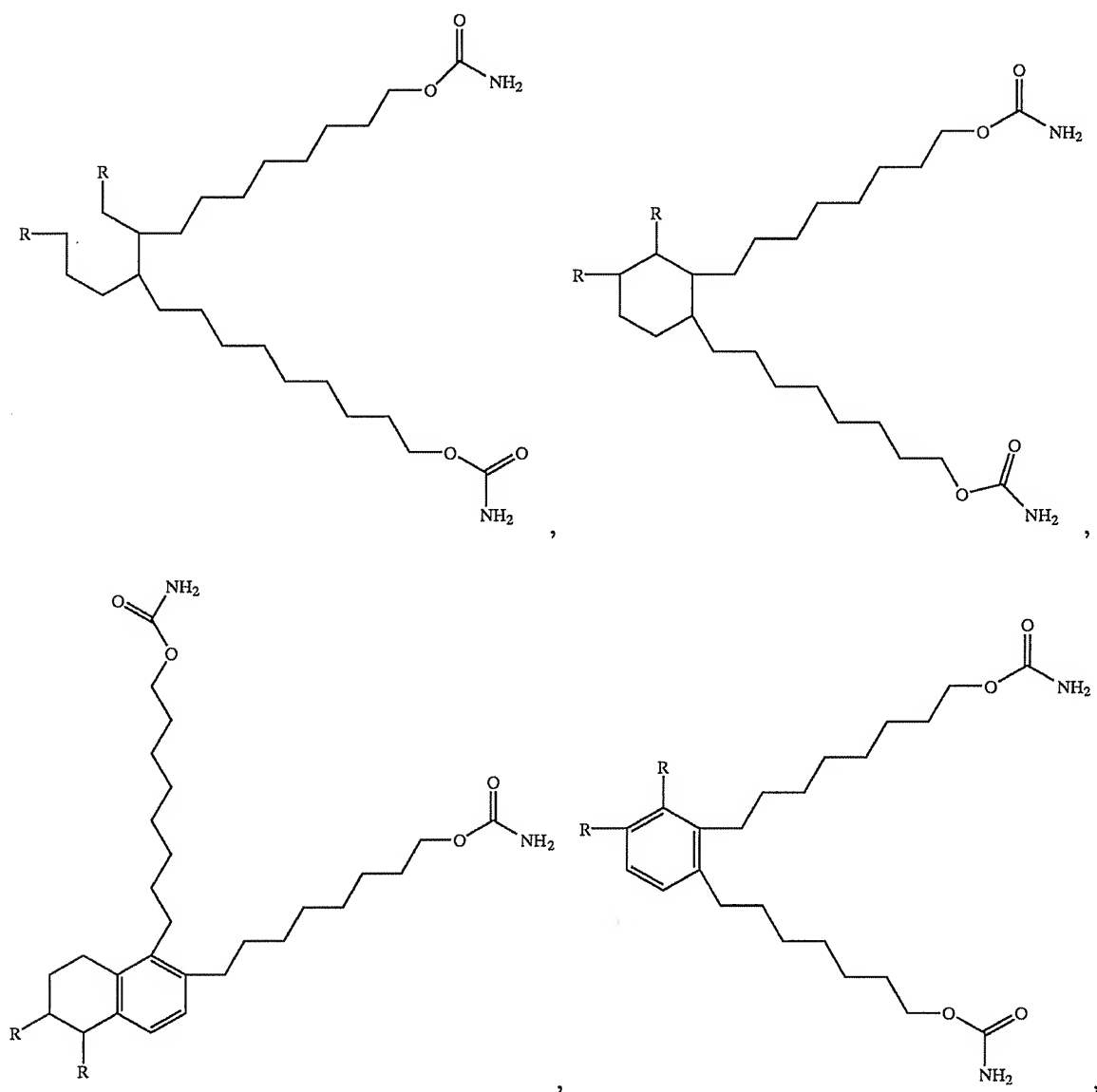
14. A method according to claim 13, wherein the coating composition further comprises fumed silica.

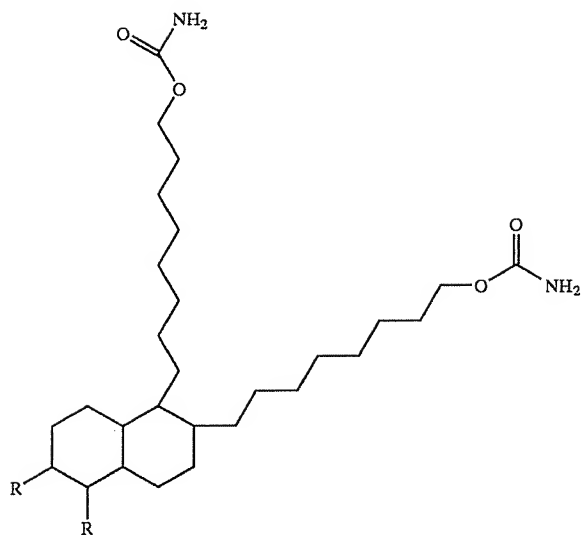
15. A method according to claim 13, wherein the thermosetting coating composition is applied as a clearcoat layer over a previously applied basecoat coating layer.

16. A thermosetting coating composition comprising:  
a film-forming component and a crystalline reaction product of an amine and an isocyanate, the film-forming component consisting of:  
at least one monomeric material having a plurality of active hydrogen groups, and  
at least one crosslinker reactive with the at least one monomeric material,  
wherein the coating composition is a clearcoat composition.



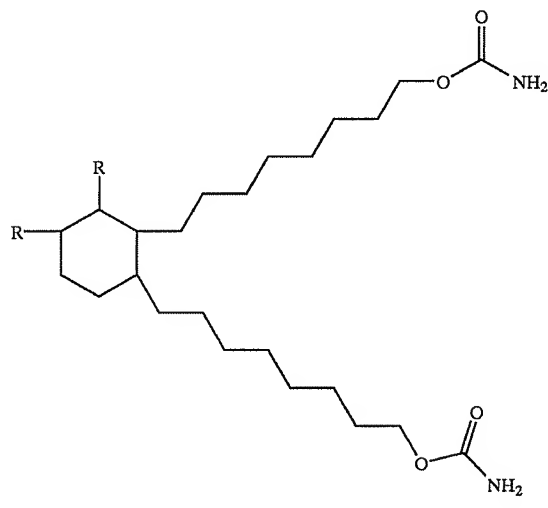
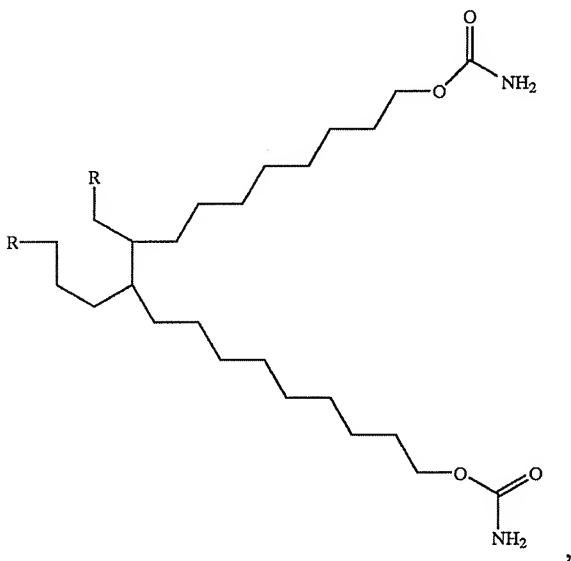
17. A thermosetting coating composition according to claim 1, wherein the at least one monomeric material having a plurality of active hydrogen groups is a member of the group consisting of:

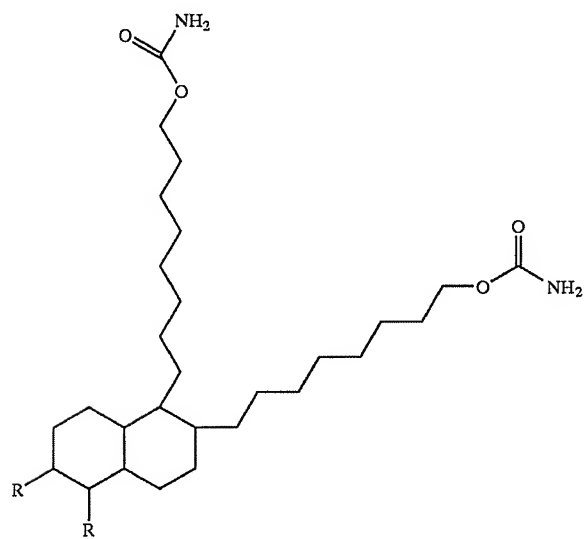
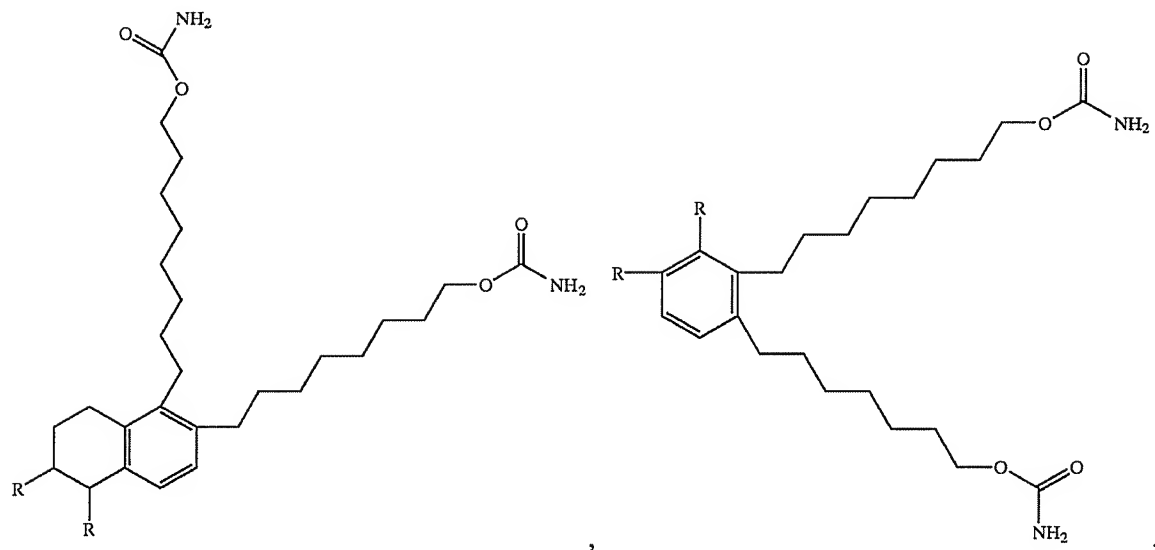




, and combinations thereof, wherein each R group is independently an alkyl of 5 to 8 carbon atoms.

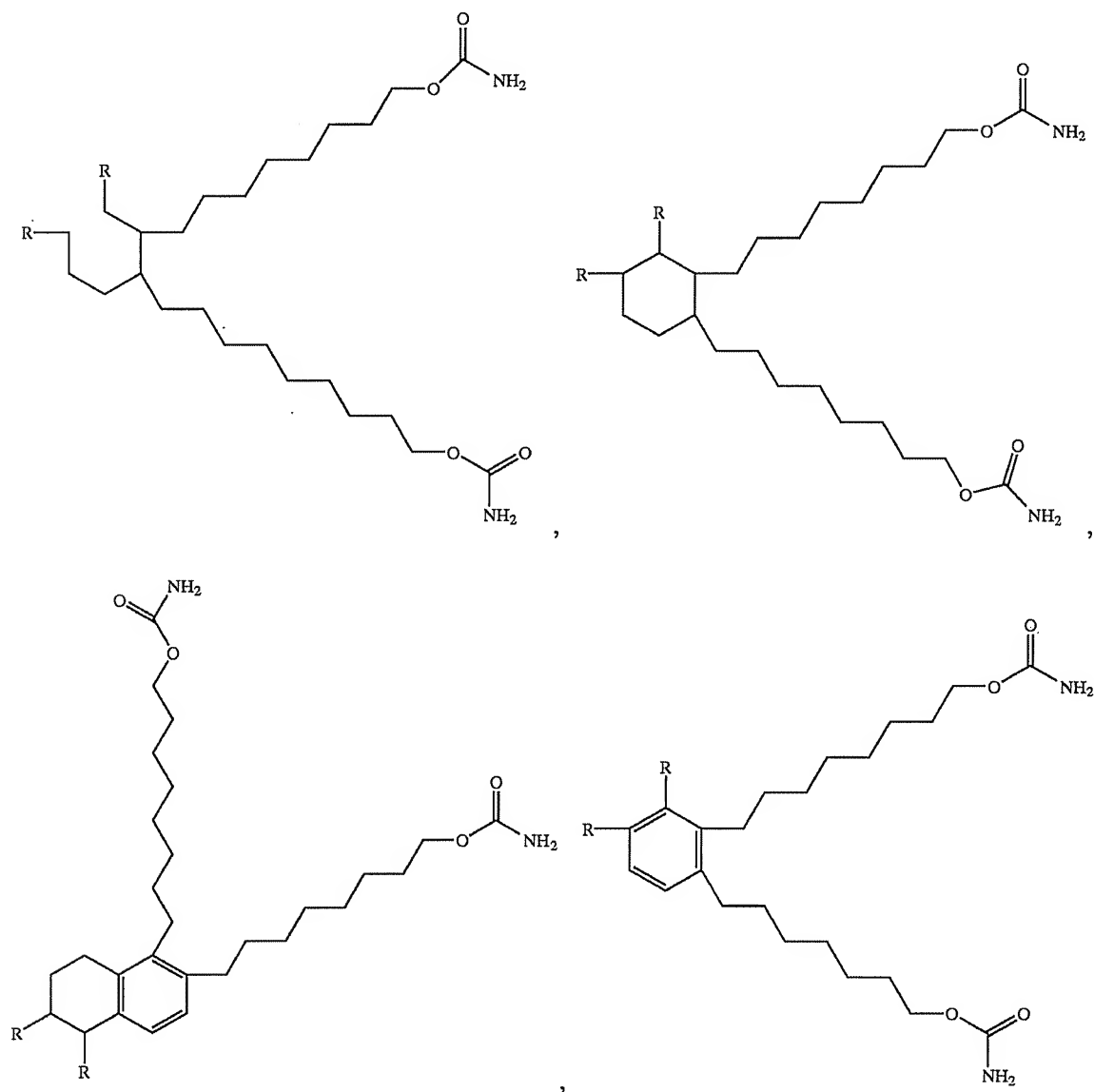
18. A method according to claim 13, wherein the at least one monomeric material having a plurality of active hydrogen groups is a member of the group consisting of:

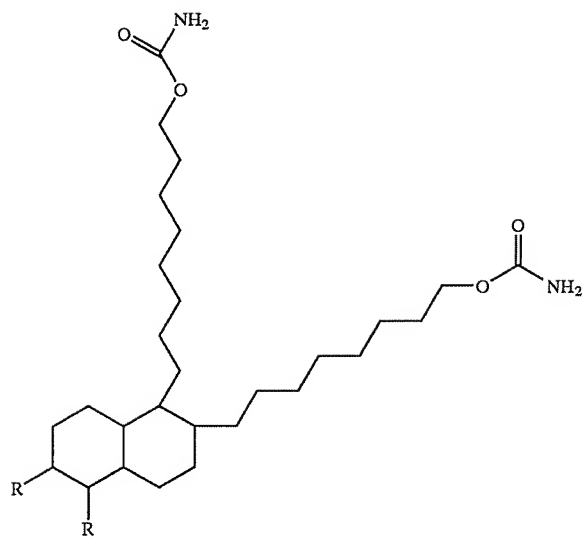




, and combinations thereof, wherein each R group is independently an alkyl of 5 to 8 carbon atoms.

19. A thermosetting coating composition according to claim 16, wherein the at least one monomeric material having a plurality of active hydrogen groups is a member of the group consisting of:





, and combinations thereof, wherein each R group is independently an alkyl of 5 to 8 carbon atoms.

## **Evidence Appendix**

### **1. Evidence entered by Examiner**

Attached is a copy of “Reactive Polymers Fundamentals and Application A Concise Guide to Industrial Polymers,” page 82 submitted by the Examiner in the Office Action dated Sept. 29, 2008, which is illegible to Appellants. The present 35 U.S.C. § 102 rejection relies on this document as evidence. Appellants requested a legible copy in the Amendment filed June 22, 2009 on page 17. However, the only copies available to Appellants – the document posted to Private PAIR and the hardcopy provided with the Office Action dated Sept. 29, 2008 – are both illegible.

Appellants’ goal in submitting this document is to have it noted in the record that the contents of this document are not properly part of the record. As illustrated in the Argument section of this brief, it is Appellants position that the term “macromonomer” has no bearing on the claims under appeal. However, Appellants further submit that the Examiner also cannot properly rely on this document as its contents are illegible and unknown to Appellants. Appellants submit that the document is effectively not part of the record at this time and cannot be relied on for the 35 U.S.C. § 102 rejection.

# REACTIVE POLYMERS FUNDAMENTALS AND APPLICATIONS

A CONCISE GUIDE TO INDUSTRIAL POLYMERS

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### 1. Role of Technology in Publishing News

*Descriptive polymerization: fundamentals and applications, a concise guide to important polymers* by Johannes Karl Fink

Verfahren: graphisch (Skizze) und textuell.

1. Glands and testes; 2. Glands and testes—degenerative applications; 3. Epid. of Sperm.

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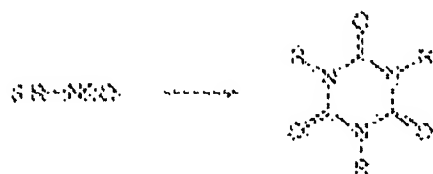


Figure 2.33: Cyclization: Formation of a Loop Polymer Structure.

**Macromonomers.** A macromonomer is a polymer that contains reactive groups that can be used to form a macromonomer from a monomer. For example, 1,3-bis(methoxycarbonyl)benzene that bears a 1-(3-oxopropyl)phenyl-1,1-dimethyl-2-methyl-2-propyl group can be used to synthesize a macromonomer. However, 1,3-bis(methoxycarbonyl)benzene (BMA) reacts with 2-oxopropylbenzene preferentially in an addition reaction that occurs as chain growth agent to radical telomerization. In this way, an adduct of the methacrylate and the oxopropyl compound is formed. The structure of the adduct and the product of functionalization are shown in Figure 2.34. The oligomers can be then functionalized with 1-(3-oxopropyl)phenyl-1,1-dimethyl-2-methyl-2-propyl (TMA), resulting in macromonomers.<sup>22</sup>

$\alpha,\omega$ -Dihydroxy-poly(benzyl acrylate) prepared by anion transfer radical polymerization (ATRP) has been used as a macroinitiator with two hydroxyl groups at one end. This macromonomer was used for chain extension of diisocyanate- $\alpha,\omega$ -dihydroxy to obtain controlled oligo (acrylate)s, as shown in Figure 2.35. These materials have potential interest as pressure sensitive adhesives (PSA).<sup>23</sup>

In a completely different way endite macromonomers were obtained. In a first step, the  $\beta$ -C bond in benzyl acrylate was polymerized by titanium catalysis in a living polymerization. The living chain end was deactivated by methacryloyl chloride to result in a methacryloyl-terminated poly(benzyl acrylate).<sup>24</sup>

Block copolymers from methyl acrylate and styrene have been obtained by a living polymerization technique.<sup>25</sup> The living anionic polymerization proceeds very fast and therefore low temperatures ( $-90^\circ\text{C}$ ) are required to control the selectivity. 1,5-hexadiene (nonconjugated diene) with  $\alpha,\omega$  Figure 2.35, is a monomer from the type  $\text{AB}_2$ . It can be polymerized to form dendritic polymers. These polymers contain perfluorinated groups that can be crosslinked with diisocyanate.<sup>26</sup>

## 2. Evidence entered by Appellants

### 2.1 Pages 8-9 of Appellants' Amendment dated September 18, 2008. The original sources are provided in Sections 2.2, 2.3, and 2.4.

As provided by *Phillips v. AWH Corp.*, one may look to extrinsic sources regarding the meaning of technical terms in the art. The International Union of Pure and Applied Chemistry (IUPAC), to which the National Academy of Sciences in the United States is an adhering body, publishes a compendium of chemical terminology known as the Gold Book, which is available online at <http://goldbook.iupac.org/M04018.html>. The Gold Book defines monomer, oligomer, and polymer (and adjectival uses thereof, such as monomeric material), as follows:

**monomer molecule:** A molecule which can undergo polymerization thereby contributing constitutional units to the essential structure of a macromolecule.

**monomeric unit** (monomer unit, mer): The largest constitutional unit contributed by a single monomer molecule to the structure of a macromolecule or oligomer molecule. Note: The largest constitutional unit contributed by a single monomer molecule to the structure of a macromolecule or oligomer molecule may be described as either monomeric, or by monomer used adjectivally.

**oligomer molecule:** A molecule of intermediate relative molecular mass, the structure of which essentially comprises a small plurality of units derived, actually or conceptually, from molecules of lower relative molecular mass. Notes: A molecule is regarded as having an intermediate relative molecular mass if it has properties which do vary significantly with the removal of one or a few of the units. If a part or the whole of the molecule has an intermediate relative molecular mass and essentially comprises a small plurality of units derived, actually or conceptually, from molecules of lower relative molecular mass, it may be described as oligomeric, or by oligomer used adjectivally.

**polymer molecule:** See: macromolecule

**macromolecule (polymer molecule):** A molecule of high relative molecular mass, the structure of which essentially comprises the multiple repetition of units derived, actually or conceptually, from molecules of low relative molecular mass. Notes: In many cases, especially for synthetic polymers, a molecule can be regarded as having a high relative molecular mass if the addition or removal of one or a few of the units has a negligible effect on the molecular properties. This statement fails in the case of certain macromolecules for which the properties may be critically dependent on fine details of the molecular structure. If a part or the whole of the molecule has a high relative molecular mass and essentially

comprises the multiple repetition of units derived, actually or conceptually, from molecules of low relative molecular mass, it may be described as either macromolecular or polymeric, or by polymer used adjectivally.

As such, a small plurality of monomer units may be used to form an oligomer, and a monomer and an oligomer are recognized as two different types of materials and are not one in the same.

In further support, Appellants submit that “[p]olymers are large molecules made up of simple repeating units. . . . *Macromolecule* is a term synonymous with polymer. Polymers are synthesized from simple molecules called *monomers* (‘single part’) by a process called *polymerization*.” Malcolm P. Stevens, Polymer Chemistry, An Introduction, 3<sup>rd</sup> Ed., p. 3, Copyright © 1999 by Oxford University Press. “As already mentioned, the term *polymer* refers to large molecules – macromolecules – whose structure depends on the monomer or monomers used in their preparation. If only a few monomer units are joined together, the resulting low-molecular weight polymer is called an *oligomer* (Greek *oligos*, ‘few’).” Id at 6. Therefore, as recognized in the art, the term oligomer refers to short polymers, typically formed of a few monomer units. “The conversion of a monomer or a mixture of monomers into an oligomer is defined as oligomerization. Encyclopedia of Polymer Science and Engineering, 2<sup>nd</sup> Ed., Vol. 10, p. 432, Copyright © 1988 by John Wiley & Sons. The illustrative examples of monomeric materials provided in the present disclosure in paragraphs [0013]-[0027] comport with these definitions and a skilled artisan would invariably conclude that a monomeric material (as used in independent claims 1 and 13) is not and does not include an oligomeric material.

- 2.2 International Union of Pure and Applied Chemistry (IUPAC) Compendium of Chemical Terminology, 2<sup>nd</sup> ed. (the “Gold Book”). Compiled by A.D. McNaught and A. Wilkinson. Blackwell Scientific Publications, Oxford (1997). XML online corrected version created M. Nic, J. Jirat, B. Kosata; updates compiled by A. Jenkins, ISBN 0-9678550-9-8. doi:10.1351/goldbook, which is available online at <http://goldbook.iupac.org/>.



IUPAC &gt; Gold Book &gt; alpha

PREVIOUS  
monomer

## Indexes

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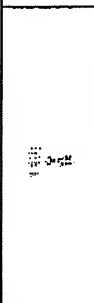

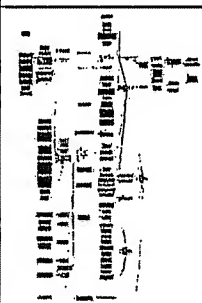
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**monomer molecule**

A molecule which can undergo polymerization thereby contributing constitutional units to the essential structure of a macromolecule.

**Source:**

PAC, 1996, 68, 2287 (*Glossary of basic terms in polymer science (IUPAC Recommendations 1996)*) on page 2289

| Interactive Link Maps                                                             |                                                                                   |                                                                                   |
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[monomer unit](#)

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**monomeric unit (monomer unit, mer)**

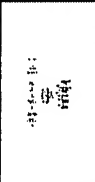

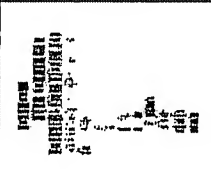
The largest constitutional unit contributed by a single monomer molecule to the structure of a macromolecule or oligomer molecule.

**Note:**

The largest constitutional unit contributed by a single monomer molecule to the structure of a macromolecule or oligomer molecule may be described as ell adjectivally.

**Source:**

PAC, 1996, 68, 2287 (*Glossary of basic terms in polymer science (IUPAC Recommendations 1996)*) on page 2290

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IUPAC &gt; Gold Book &gt; alpha

[PREVIOUS](#)  
[oligomer](#)

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**oligomer molecule**

A molecule of intermediate relative molecular mass, the structure of which essentially comprises a small plurality of units derived, actually or conceptually, from a molecular mass.

**Notes:**

1. A molecule is regarded as having an intermediate relative molecular mass if it has properties which do vary significantly with the removal of one or a few units.
2. If a part or the whole of the molecule has an intermediate relative molecular mass and essentially comprises a small plurality of units derived, actually or conceptually, from a molecular mass, it may be described as oligomeric, or by oligomer used adjectivally.

**Source:**

PAC, 1996, 69, 2287 (*Glossary of basic terms in polymer science (IUPAC Recommendations 1996)*) on page 2289

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IUPAC &gt; Gold Book &gt; alpi

PREVIOUS

polymer membrane

**polymer molecule**

See: macromolecule

Source:

PAC, 1996, 68, 2287 (*Glossary of basic terms in polymer science (IUPAC Recommendations 1996)*) on page 2289

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## PREVIOUS

macromolecular isomorphism

## macromolecule (polymer molecule)

A molecule of high relative molecular mass, the structure of which essentially comprises the multiple repetition of units derived, actually or conceptually, from mass.

## Notes:

1. In many cases, especially for synthetic polymers, a molecule can be regarded as having a high relative molecular mass if the addition or removal of one unit has a significant effect on the molecular properties. This statement fails in the case of certain macromolecules for which the properties may be critically dependent on the molecular mass.
2. If a part or the whole of the molecule has a high relative molecular mass and essentially comprises the multiple repetition of units derived, actually or conceptually, from mass, it may be described as either macromolecular or polymeric, or by polymer used adjectivally.

## Source:

PAC, 1998, 68, 2267 (*Glossary of basic terms in polymer science (IUPAC Recommendations 1996)*) on page 2289

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Original PDF version (may be out of date): <http://www.iupac.org/goldbook/M03667.pdf>.

2.3 Pages 3 and 6 of Malcolm P. Stevens, Polymer Chemistry, An Introduction, 3<sup>rd</sup> Ed., p. 3, Copyright © 1999 by Oxford University Press.

# C H A 1 T E R

## BASIC PRINCIPLES

### 1.1 Introduction and Historical Development

We live in a polymer age. Plastics, fibers, elastomers, coatings, adhesives, rubber, protein, cellulose—these are all common terms in our modern vocabulary, and all a part of the fascinating world of polymer chemistry. Innumerable examples of synthetic polymers may be cited, some everyday ones, others esoteric: polyester and nylon textile fibers; high-strength polyamide fibers for lightweight bulletproof vests; polyethylene plastic for milk bottles; polyurethane plastic for an artificial heart; rubber for automobile tires; fluorinated phosphazene elastomers that remain flexible in arctic environments. Whatever example or application one might select for purposes of illustration, an underlying consideration is that the particular polymer, for reasons of its unique properties or its economy, or both, is used because it does the job better than other available materials.

The purpose of this book is to provide an understanding of the chemistry of polymeric materials—how these materials differ from nonpolymers, how they are synthesized, and how they may be modified to assume a range of chemical and physical properties. While the experimental techniques for handling polymers may be somewhat different from those used with low-molecular-weight compounds, the chemistry of polymers will, in most cases, be familiar to the student who has completed introductory courses in organic and physical chemistry. The major adjustment the student has to make in beginning a study of polymers is to recognize that polymers exhibit certain properties, especially macroscopic ones, that differ markedly from those of the low-molecular-weight compounds usually encountered in undergraduate courses.

Polymers are large molecules made up of simple repeating units. The name is derived from the Greek *poly*, meaning “many,” and *mer*, meaning “part.” *Macromolecule* is a term synonymous with polymer. Polymers are synthesized from simple molecules called *monomers* (“single part”) by a process called *polymerization*. Given the fact that most synthetic polymers have molecular weights in the range of several thousand up to several million atomic mass units, it is obviously impractical to attempt to write a definitive polymer structure. Instead a structural unit of the polymer is enclosed by brackets

the theories of Staudinger on a firm experimental basis and led to the commercial development of neoprene rubber and polyamide (nylon) fibers.<sup>11</sup>

World War II led to significant advances in polymer chemistry, particularly with the development of synthetic rubber when the natural rubber-growing regions of the Far East became inaccessible to the Allies. Among the more significant developments of the postwar years was the discovery by Karl Ziegler<sup>12</sup> in Germany of new coordination catalysts for initiating polymerization reactions and the application by Giulio Natta in Italy of these new systems to development of polymers having controlled stereochemistry.<sup>13</sup> Their work has revolutionized the polymer industry, for these so-called stereoregular polymers have mechanical properties superior in most instances to those of nonstereoregular polymers. The importance of their discoveries was recognized by the award of the Nobel Prize in Chemistry jointly to Ziegler and Natta in 1963. Equally significant was the work of Paul Flory<sup>14</sup> (Nobel Prize 1974), who established a quantitative basis for polymer behavior, whether it be the physical properties of macromolecules in solution or in bulk or such chemical phenomena as crosslinking and chain transfer (concepts to be encountered later in this text).

More recent years have seen a number of important advances in polymer science, which will be elaborated on in this and later chapters. Examples include:

- Polymers having excellent thermal and oxidative stability, for use in high-performance aerospace applications

- Engineering plastics—polymers designed to replace metals

- High-strength aromatic fibers, some based on liquid crystal technology, for use in a variety of applications from tire cord to cables for anchoring oceanic oil-drilling platforms

- Nonflammable polymers, including some that emit a minimum of smoke or toxic fumes

- Degradable polymers, which not only help reduce the volume of unsightly plastics waste but also allow controlled release of drugs or agricultural chemicals

- Polymers for a broad spectrum of medical applications, from degradable sutures to artificial organs

- Conducting polymers—polymers that exhibit electrical conductivities comparable to those of metals

- Polymers that serve as insoluble supports for catalysts or for automated protein or nucleic acid synthesis (Bruce Merrifield, who originated solid-phase protein synthesis, was awarded the Nobel Prize in Chemistry in 1984)

This list, by no means exhaustive, clearly illustrates that polymer chemistry is an exciting field with almost limitless possibilities.

## 1.2 Definitions

As already mentioned, the term *polymer* refers to large molecules—macromolecules—whose structure depends on the monomer or monomers used in their preparation. If only a few monomer units are joined together, the resulting low-molecular-weight polymer is called an *oligomer* (Greek *oligos*, “few”). The structural unit enclosed by brackets or parentheses is

2.4 Page 432 of Encyclopedia of Polymer Science and Engineering, 2<sup>nd</sup> Ed., Vol. 10,  
Copyright © 1988 by John Wiley & Sons.

292. M. J. Bowden and J. Frackowiak, *Special Technical Publication 804*, American Society for Testing and Materials, Philadelphia, 1984.
293. S. A. Evans, J. L. Bartelt, B. J. Sloan, and G. L. Varnell, *J. Vac. Sci. Technol.* **15**, 969 (1978).
294. M. J. Bowden in L. F. Thompson, C. G. Willson, and J. M. J. Frechet, eds., *Materials for Microlithography: Radiation-Sensitive Polymers*, ACS Symp. Ser. 266, American Chemical Society, Washington, D.C., 1984, p. 39.
295. M. J. Bowden and L. F. Thompson, *Solid State Technol.* **22**, 72 (1979).
296. L. D. Yau and L. R. Thibault, *J. Vac. Sci. Technol.* **15**, 960 (1978).
297. M. J. Bowden, *J. Appl. Polym. Sci.* **26**, 1421 (1981).
298. U.S. Pat. 3,935,331 (Jan. 27, 1976), E. S. Poliniak, H. G. Scheible, and R. J. Himics (to R.C.A. Corp.).
299. U.S. Pat. 4,097,618 (June 27, 1978), E. S. Poliniak (to R.C.A. Corp.).
300. U.S. Pat. 4,267,257 (May 12, 1981), E. S. Poliniak and N. V. Desai (to R.C.A. Corp.).
301. U.S. Pat. 4,329,410 A (May 11, 1982), D. W. Buckley (to Perkin-Elmer Corp.).
302. U.S. Pat. 3,873,492 (Mar. 25, 1975), M. Takehisa, H. Kurihara, T. Yagi, H. Wanatabe, and S. Machi (to Japan Atomic Energy Research Institute).

ALLAN H. FAWCETT

The Queen's University of Belfast

## OLIGOMERS

The International Union of Pure and Applied Chemistry (IUPAC) defines oligomer as a substance composed of molecules containing a few of one or more species of atoms or groups of atoms (constitutional units) repetitively linked to each other (1). This does not specify an absolute degree of polymerization or molecular weight that distinguishes an oligomer from a polymer, but the IUPAC definition further states that the physical properties of an oligomer vary with the addition or removal of one or a few of the constitutional units from its molecules. This structure-property definition is perhaps the most meaningful definition of an oligomer. The conversion of a monomer or a mixture of monomers into an oligomer is defined as oligomerization. This definition does not imply any constraints on the oligomer polydispersity. Therefore, although monodisperse oligomers provide more valuable information than polydisperse oligomers, the latter are still important.

The term oligomer originates from the Greek words *ολιγοζ* = few and *μεροζ* = part, and was first used in the field of synthetic polymer chemistry in the early 1950s (2), having been taken from the nomenclature of natural products, ie, oligosaccharides (3), oligopeptides (4), etc. A recent book on the history of polymer science (qv) (5) asserts that the name was first suggested by L. V. Larsen for a laboratory manual published by G. F. D'Alelio in 1943 (6). The name oligomer has been adopted by Kern (7) and Zahn (8), and their extensive work in this field led to its present widely accepted meaning.

The first attempts made by Staudinger to convince the organic chemistry community of the macromolecular nature of polymers were partially based on research performed on oligomers (9). Staudinger and Luthy (10) separated the  $\alpha,\omega$ -dimethyl ethers of polyoxymethylene (POM) with degrees of polymerization (DP) up to 14 and the  $\alpha,\omega$ -dimethyl esters of POM with DP up to 20. Although

### **Related Proceedings Appendix**

Attached is a copy of Appeal 2008-3412 before the Board of Patent Appeals and Interferences, decided July 18, 2008.

UNITED STATES PATENT AND TRADEMARK OFFICE

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BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES

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*Ex parte* MARVIN L. GREEN,  
SWAMINATHAN RAMESH, and  
WALTER H. OHRBOM

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Appeal 2008-3412  
Application 10/732,850  
Technology Center 1700

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Decided: July 18, 2008

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Before EDWARD C. KIMLIN, THOMAS A. WALTZ, and  
PETER F. KRATZ, *Administrative Patent Judges*.

KRATZ, *Administrative Patent Judge*.

DECISION ON APPEAL

This is a decision on an appeal from the Examiner's final rejection of  
claims 1-15. We have jurisdiction pursuant to 35 U.S.C. § 6.



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Application 10/732,850

Appellants' asserted invention is directed to a sag-resistant, non-polymeric coating composition including at least one monomeric material with active hydrogen groups, a cross-linker, and a crystalline reaction product of an amine and an isocyanate and a method of preparing same. Claims 1 and 13 are illustrative and reproduced below:

1. A thermosetting, non-polymeric coating composition comprising at least one monomeric material having a plurality of active hydrogen groups,

at least one crosslinker reactive with the at least one monomeric material, and

a crystalline reaction product of an amine and an isocyanate.

13. A method of coating a substrate with a coating composition, having steps of:

applying to the substrate a layer of thermosetting, non-polymeric coating composition comprising at least one monomeric material having a plurality of active hydrogen groups, at least one crosslinker reactive with the at least one monomeric material, and a crystalline reaction product of a primary monoamine and an isocyanate; and

curing the applied layer to produce a cured coating layer on the substrate.

The Examiner relies on the following prior art references as evidence in rejecting the appealed claims:

|          |                 |               |
|----------|-----------------|---------------|
| Ohrbom   | 5,756,213       | May 26, 1998  |
| Green    | 5,872,195       | Feb. 16, 1999 |
| Boisseau | 2002/0155278 A1 | Oct. 24, 2002 |

Claims 1-3 and 7-15 stand rejected under 35 U.S.C. § 102(b) as being anticipated by Boisseau. Claims 1-15 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Boisseau in view of Green and Ohrbom.

We affirm both rejections. Our reasoning follows.

For the rejection under 35 U.S.C. § 102(b), we note that in order “[t]o anticipate a claim, a prior art reference must disclose every limitation of the claimed invention, either explicitly or inherently.” *In re Schreiber*, 128 F.3d 1473, 1477 (Fed. Cir. 1997); *accord Glaxo, Inc. v. Novopharm, Ltd.*, 52 F.3d 1043, 1047 (Fed. Cir. 1995). However, anticipation by a prior art reference does not require that the reference recognize either the inventive concept of the claimed subject matter or the inherent properties that may be possessed by the prior art reference. *See Verdegaal Bros., Inc. v. Union Oil Co.*, 814 F.2d 628, 633 (Fed. Cir.), *cert. denied*, 484 U.S. 827 (1987).

Appellants argue the claims together as a group with respect to the anticipation rejection. Thus, we select claim 1 as the representative claim on which we decide this appeal as to the § 102(b) rejection.

Appellants do not argue that Boisseau fails to disclose a coating composition including a material with active hydrogen, a cross-linker, and a crystalline reaction product of an amine and an isocyanate. Rather, Appellants contend that Boisseau’s active hydrogen containing material is not a material corresponding to Appellants’ active-hydrogen-containing monomeric material. Representative claim 1 requires that the composition includes at least one such monomeric material (Br. 3-4 and Reply Br. 2-5).

On the other hand, the Examiner has determined that the representative claim 1 requirement for a non-polymeric coating composition that includes, *inter alia*, a monomeric material, reads on a coating

composition described by Boisseau. According to the Examiner, the representative claim 1 requirement for at least one monomeric material as being part of the coating composition reads on the active-hydrogen group-containing component of the coating composition of Boisseau. In this regard, the Examiner has determined that the contested claim terms “at least one monomeric material” and “non-polymeric” are broad terms that not only do not exclude the presence of polymers and/or oligomers in the claimed composition but also are open to using a multiple monomer unit-containing material as the at least one monomeric material. Thus, the Examiner has determined that Boisseau discloses film forming components, such as oligomers, that fall within the scope of the representative claim 1 requirement for at least one monomeric material (Ans. 4-5).

During prosecution of a patent application, the claims therein are given the broadest reasonable interpretation consistent with the Specification as it would be understood by one of ordinary skill in the art. *Gechter v. Davidson*, 116 F.3d 1454, 1457, 1460 n.3 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321-22 (Fed. Cir. 1989). As pointed out by the court in *In re Morris*, 127 F.3d 1048, 1056 (Fed. Cir. 1997):

Absent an express definition in their specification, the fact that appellants can point to definitions or usages that conform to their interpretation does not make the PTO's definition unreasonable when the PTO can point to other sources that support their interpretation.

Here, the claim terms “non-polymeric” as used in the representative claim 1 preamble and “at least one monomeric material...” are not defined in the subject Specification. We note that the claimed composition can include both polymeric and non-polymeric constituents as evidenced by the

use of the transitional term “comprising” in representative claim 1. This interpretation is consistent with the Specification Examples in that Appellants present Examples of their allegedly inventive non-polymeric composition that includes carbamate-functional acrylic polymer as part of a fumed silica dispersion additive with or without carbamate-functional resin (Specification, Examples 4-6).

As for the required at least one monomeric material, Appellants refer to an extrinsic reference source (Br. 3-4). The excerpts cited from *Encyclopedia of Polymer Science and Engineering* (2d Ed.), Vol. 10, pp. 25 and 432 (1988), basically define a monomer as being a compound that can be converted into an oligomer, which oligomer, itself, comprises a few constitutional units made of monomer molecules. A monomer is further defined as a compound which is capable of furnishing one or more constitutional parts of a polymer or oligomer. However, this definition of monomer is not subscribed to by Appellants in their Specification. Moreover, representative claim 1 does not employ the argued term “monomer” but rather the claim term “at least one monomeric material.”

Additionally, the Specification examples and described specific embodiments of materials do not indicate that a strict definition is being employed for the representative claim 1 term “monomeric material.” There is nothing we can find in the Specification that strictly limits the claimed composition by requiring that the monomeric material constituent must include at least one compound or molecule of low molecular weight and simple structure as part of the claimed composition. Nor have Appellants pointed out where the Specification specifically excludes more complex compounds (oligomers, incompletely polymerized polymers, and/or non-

cross-linked polymers) from the claimed composition by the at least one monomeric material language, including exclusion of the oligomers described by Boisseau. In this regard, Appellant has not established that Boisseau's oligomers are not capable of further polymerization reaction and capable of forming a constitutional part of a cured polymer. Indeed, as evidenced by Boisseau's disclosure of subsequent curing (Boisseau, ¶¶ 0019, 0022, 0048, 0050, 0054, 0056, 0096, 0099), the oligomers of Boisseau reasonably appear to be capable of undergoing further reaction to form a constitutional part of a polymer.

Appellants seemingly argue that their exemplified monomeric materials, which can include an addition product, (Reply Br. 2-5; Specification ¶¶ 0013-0027), do not include more complex oligomeric materials or poly addition products. However, Appellants make it abundantly clear at page 4 of the Specification that the articles "a" or "an" as employed by Appellants are to be interpreted to include one or more than one. Thus, the addition reactions described in the Specification do not specifically exclude poly additions and the products formed therefrom (oligomeric materials) as being within the scope of the claimed "at least one monomeric material;" that is, a material capable of forming a constituent part of a subsequently cured polymer.

Appellants' Specification lends additional support for a broadest reasonable claim construction that is not at all limited by any examples and embodiments described in the Specification as Appellants seemingly argue. This is because Appellants state upfront that "[t]he following description of the preferred embodiment(s) is merely exemplary in nature and is in no way intended to limit the invention, its application, or uses" (Specification ¶

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0011). Thus, the Specification makes plain that the claims before us are not limited to the preferred and exemplified embodiments. Furthermore, it is well settled that in interpreting claim terms it is inappropriate to read in further limitations from the Specification. *In re Paulsen*, 30 F.3d 1475, 1480 (Fed. Cir. 1994).

On this record, we agree with the Examiner that Boisseau describes a composition that is within the scope of representative claim 1. Consequently, we affirm the Examiner's anticipation rejection of claims 1-3 and 7-15, on this record.

Concerning the rejection under 35 U.S.C. § 103, the factual inquiry into obviousness requires a determination of: (1) the scope and content of the prior art; (2) the differences between the claimed subject matter and the prior art; (3) the level of ordinary skill in the art; and (4) any secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18 (1966). "[A]nalysis [of whether the subject matter of a claim is obvious] need not seek out precise teachings directed to the specific subject matter of the challenged claim, for a court can take account of the inferences and creative steps that a person of ordinary skill in the art would employ." *KSR Int'l Co. Teleflex, Inc.*, 127 S. Ct. 1727, 1741 (2007).

Claims 1-4 and 7-15 are argued as a group. We select claim 1 as the representative claim for this claim grouping. We shall consider claims 5 and 6 separately to the extent that they are separately argued.

We note that a disclosure that anticipates under 35 U.S.C. § 102 also renders the claim unpatentable under 35 U.S.C. § 103, for "anticipation is the epitome of obviousness." *Jones v. Hardy*, 727 F.2d 1524, 1529 (Fed. Cir. 1984). Also, see *In re Fracalossi*, 681 F.2d 792, 794 (CCPA 1982); *In*

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*re Pearson*, 494 F.2d 1399, 1402 (CCPA 1974). Consequently, claims 1-3 and 7-15 are found to be prima facie obvious based on our anticipation determination as to these claims.

In addition to disclosing a coating composition that can include oligomers and/or polymers as the active hydrogen containing film forming component, Boisseau discloses or suggests that the film forming component of the coating composition can include carbonate functional (active-hydrogen) compounds from a variety of sources (¶¶ 0048, 0096-0098) and that these compounds can be of low molecular weight. In this regard, the Examiner has further found that Green discloses that monomeric carbamate compounds are known to be useful as part of a similar thermosetting curable coating composition (Ans., 4; Green; col. 2, ll. 5-10 and col. 5, ll. 37-43). As evidenced by Appellants' dependent claims 2 and 4 for example, compounds containing at least one carbamate group fall within the scope of the hydrogen active compounds required by Appellants' claimed invention. Also, the Examiner has found that Ohrbom further suggests the use of film forming compounds within the scope of claims 5 and 6 in a similar coating (Ans. 4). Moreover, as evidenced by component (c) of Green (col. 5, l. 28-col. 8, l. 40 and col. 10, ll. 25-30), the inclusion of such known monomer hydrogen active compounds in a film forming component of a similar coating composition is a known alternative for obtaining desirable coatings.

Thus, even if representative claim 1 were considered to require at least one non-oligomeric and non-polymeric hydrogen active monomer compound as part of the called for monomeric material, one of ordinary skill in the art would have found a suggestion in the disclosure of Boisseau alone or in combination with Green and Ohrbom that would have reasonably led to

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the use of at least one such known hydrogen active monomer as part of the film forming component of Boisseau's composition.

As for separately argued claims 5 and 6, we select claim 5 as the representative claim. Ohrbom discloses forming hydrogen active carbamate group-containing compounds using lactones or an hydroxyl carboxylic acid and carbonate functional compounds as reactants (col. 4, ll. 1-14), which reaction products are useful as film formers in a similar coating composition to that of Boisseau. As such, Appellants separate arguments for dependent claims 5 and 6 do not serve to identify reversible error in the Examiner's obviousness rejection based on the combined teachings of the references.

#### CONCLUSION

The decision of the Examiner to reject claims 1-3 and 7-15 under 35 U.S.C. § 102(b) as being anticipated by Boisseau and to reject claims 1-15 under 35 U.S.C. § 103(a) as being unpatentable over Boisseau in view of Green and Ohrbom is affirmed.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a)(1)(iv).

#### AFFIRMED

tf/lr

HARNESS, DICKY AND PIERCE, P.L.C..  
5445 CORPORATE DRIVE  
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